PATENT
Docket No. 10551/491

UNITED STATES PATENT APPLICATION

FOR

TACKY SHEETS WITH REDUCED GLARE OR SHINE

INVENTORS:

Ronald D. Blum
William Kokonaski
Dwight P. Duston

PREPARED BY:

KENYON & KENYON
1500 K STREET, N.W.
SUITE 700
WASHINGTON, D.C. 20005

(202) 220-4200

TACKY SHEETS WITH REDUCED GLARE OR SHINE

[001] This application claims the benefit under 35 USC section 119(e) of U.S. provisional application 60/400,087, filed August 2, 2002. Further, this application is a continuation-in-part of U.S. application no. 09/935,672, filed August 24, 2001. U.S. application no. 09/935,672 is a continuation-in-part of international application no. PCT/US00/30206, filed November 2, 2000, which is a continuation-in-part of U.S. application no. 09/553,234, filed April 19, 2000 and issued May 22, 2001 as U.S. patent no. 6,233,776. Application no. 09/553,234 is a continuation-in-part of U.S. application no. 09/418,752, filed October 15, 1999, which is a continuation-in-part of U.S. application no. 09/304,051, filed May 4, 1999 and issued April 24, 2001 as U.S. patent no. 6,219,876. All of the foregoing applications are fully incorporated herein by reference.

Background and Discussion of the Invention

[002] The present invention relates to a floor mat. More specifically, the invention provides a floor mat that includes a cleanable portion. The floor mat may also include a tacky surface on the cleanable portion. If a tacky surface is included in the floor mat, an anti-slip feature may be associated with the tacky surface to help prevent slipping on a possibly wet tacky surface.

[003] Floor mats are known for cleaning the soles of a person's shoes who is about to enter a particular area or room. One problem with floor mats in general is how to keep the floor mat sufficiently clean such that it may perform its function of cleaning the person's shoes when, by its very nature, it is purposefully dirtied when performing its function. Known floor mats may be comprised of a single, unitary piece of material. Whereas these single structure floor mats may be kept clean by, for example, washing the floor mat, it may be required that the entire floor mat be removed from its location for washing and thus, the floor mat is not available where desired while the entire mat is being cleaned. Alternatively, even if the mat can be cleaned in-place, which may not be a possibility if it is located in, for example, a carpeted area, it may be inconvenient to clean the mat in-place.

[004] Tacky floor mats are by far more popular for utilization in indoor environments that are far removed from exterior outside entrances, such as for clean rooms that are well-within the interior of the building in which they are used, e.g., hospital rooms, computer chip manufacturing spaces, and gymnasiums. Thus, tacky floor

mats are not known for use in areas that are adjacent to entrances that lead from the outdoor environment for cleaning the soles of a person's shoes prior to entry into the interior of a building, such as for example in an entry foyer or on an outdoor porch.

[005] Tacky floor mats are not known for use in domestic or office-type applications, e.g., home or business office use, because of several known deficiencies. One of these deficiencies is that their tacky surface will not be as effective if it becomes wet. Therefore, if the tacky surface floor mat was utilized in an outdoor environment, such as the outdoor porch mentioned above, or in an indoor environment that is adjacent to or near an outdoor entrance, such as an entry foyer of a home or business, for cleaning a person's shoes prior to further entering the home or business, the mat is likely to become wet and therefore not effective. The mat could become wet from, for example, the moisture in the atmosphere or from moisture carried on the soles of the person's shoes who steps on the mat. Additionally, if the tacky surface becomes wet it may become slippery and thus cause a hazard for the person who steps on it.

[006] Therefore, it would be desirable to provide an advanced floor mat that could address deficiencies that exist with currently known floor mats. The advanced floor mat of the present invention overcomes deficiencies in the prior art and may include a base portion which incorporates a cleanable portion that is adapted to be removably received within the floor mat. The floor mat may also include features, as noted earlier, such as a tacky surface on the cleanable portion. If a tacky surface is included in the floor mat, an anti-slip feature may be associated with the tacky surface to help prevent slipping on a possibly wet tacky surface. Other features will be apparent from the detailed description which follows.

Brief Description of the Drawings

[007] The various features of the invention will best be appreciated by simultaneous reference to the description which follows and the accompanying drawings, in which:

[008] Fig. 1 is a perspective view of a floor mat in accordance with an embodiment of the present invention;

[009] Fig. 2 is an exploded perspective view of the floor mat of Fig. 1;

[010] Fig. 3 is an exploded side view of an alternative embodiment of the floor mat of the present invention;

[011] Fig. 4 illustrates an alternative embodiment for a tacky insert portion with an anti-slip feature for the floor mat of the present invention;

[012] Fig. 5 illustrates another alternative embodiment for a tacky insert portion with an anti-slip feature for the floor mat of the present invention;

[013] Fig. 6 is a side view of the embodiment for the tacky insert portion with an anti-slip feature of Fig. 5;

[014] Fig. 7 is a perspective view of a further embodiment for a tacky insert portion with an anti-slip feature for the floor mat of the present invention;

[015] Figs. 8A-8C show alternative configurations of an apparatus for manufacturing tacky inserts according to the present invention;

[016] Fig. 9 shows details a rotary die cutter such as could be used in the processes described in Figs. 8A-8C;

[017] Figs. 10A-10D show alternative embodiments of tacky inserts, wherein the tacky inserts have apertures configured to receive nodular anti-slip components;

[018] Fig. 11 shows an apparatus for forming a non-smooth texture in a tacky insert material, according to embodiments of the present invention;

[019] Fig. 12 illustrates an alternative apparatus for forming a non-smooth texture in a tacky insert material, according to embodiments of the present invention;

[020] Fig. 13 shows an example of a tacky insert sheet with a non-smooth texture according to embodiments of the invention; and

[021] Figs. 14A-14D show various example of a non-smooth texture.

Detailed Description

[022] Figure 1 illustrates a first embodiment for a floor mat 100 in accordance with the principles of the present invention. As can be seen in Figure 1, floor mat 100 includes a base portion 200 and a cleanable insert portion 300. As will be further described later in this specification, in this embodiment, cleanable portion 300 is received within base portion 200 and is removable from base portion 200.

[023] Figure 2 illustrates an exploded, perspective view of the floor mat of Figure 1. As can be seen in Figure 2, base portion 200 is formed as a generally flat, planar member and defines a recess 210 within the top surface of base portion 200. Base portion 200 provides sufficient weight and mass for supporting cleanable insert portion 300 and maintaining the floor mat's positioning on the surface on which it is placed. Base portion 200 may include, as will be discussed below, a water dissipation capability, a water absorption capability, and a cushioning capability and may be comprised of materials such as polyurethane, polyisoprene and other cross-linked elastomeric materials, such as nylon-6, molded or woven to form a porous structure. Recess 210 can be configured in any of a variety of geometric configurations, however, in the present embodiment, recess 210 is configured in a rectangular shape. Recess 210 has a length L_1 and a width W_1. The depth of recess 210 is such that it is able to receive within it cleanable insert portion 300 such that when cleanable insert portion 300 is received within recess 210, the top surface of cleanable insert portion 300 lies generally in the same plane as the top surface of base portion 200.

[024] The top surface of base portion 200 may be colored with any color depending upon the desires of a particular purchaser, however, it is preferable that a color be utilized that will minimize the visibility of any dirt that is accumulated by base portion 200. For example, it may be desirable that darker colors be utilized for the top surface of base portion 200 rather than lighter colors. However, again, any particular color may be utilized for base portion 200, and particularly the top surface of base portion 200, depending upon the particular desires of an individual. Additionally, the base portion 200 may be either translucent or opaque.

[025] As can be seen in Figure 2, the surface of base portion 200 which defines the bottom of recess 210 may include graphics 220 on that surface. In the illustrated

embodiment, the graphics include pictorial representations of flowers and a text message which spells out the word "WELCOME". The present invention is not limited to any particular graphic within recess 210 and the present invention may include any of a variety of different forms of graphics.

[026] Figure 2 also further illustrates cleanable insert portion 300. As can be seen, cleanable insert portion 300 has a geometric shape which is complementary in size and form to the recess 210 that is formed within base portion 200. As such, cleanable insert portion 300 is able to be received securely within recess 210. Thus, cleanable insert portion 300 has a length L_2 which is just slightly smaller than the length L_1 of recess 210. Likewise, cleanable insert portion 300 has a width W_2 which is also just slightly smaller than width W_1 of recess 210.

[027] On the bottom side 310 of cleanable insert portion 300, i.e., that surface which contacts the surface which defines the bottom of recess 210, an attachment mechanism may be provided such that cleanable insert portion 300 may be removably attached to base portion 200 within recess 210. Any of a variety of different attachment mechanisms may be provided on the bottom surface of cleanable insert portion 300 to include, for example, a hook and loop fastener assembly or an adhesive. Regardless of the particular securement mechanism used to removably attach cleanable insert portion 300 to base portion 200, in this embodiment, cleanable insert portion 300 may be removed from base portion 200 such that it may be cleaned by a user and, after cleaning, be reinserted within recess 210 such that a clean surface is now provided for floor mat 100.

[028] Cleanable insert portion 300 may be formed from a transparent material such as hydrophilic aliphatic acrylic polymers and copolymers incorporating acrylic acid, hydroxy ethyl methacrylate, and glycerin monomethacrylate. Forming cleanable insert portion 300 of a transparent material would allow an individual to view the customized graphics that may be provided within floor mat 100, as discussed previously. Alternatively, the insert portion 300 could be opaque.

[029] The top side of cleanable insert portion 300 may include a tacky surface. The tacky surface would provide for assisting in removing debris from the soles of a person's shoes that is standing on cleanable insert portion 300. When the top tacky surface of cleanable insert portion 300 is dirtied to such an extent that the user desires to clean insert

portion 300, in this embodiment, the user removes insert portion 300 from base portion 200 and cleans insert portion 300 to remove the accumulated debris. The insert portion 300 is then reinserted into base portion 200.

[030] The tacky surface that is provided on the top side of cleanable insert portion 300 could be comprised of any of a variety of materials, such as polyvinyl chlorides combined with a suitable plasticizer, plasticized neoprene, polysulfides, and polyurethanes. Additionally, acrylics, such as butyl acrylate and many of its homologues, may be utilized. Again, the present invention is not limited to any particular material. The tacky surface may be formed, generally, from any adhesive material. The only consideration, in this embodiment, is that the surface should maintain its tacky characteristic even after repeated cleaning cycles.

[031] Figure 3 illustrates an alternative embodiment for floor mat 100. In Figure 3, it is illustrated that base portion 200 may include separate layers for a water dissipation component 230 and a cushioning component 240. Water dissipation component 230, in this embodiment, is disposed on a top side of the cushioning component 240. However, the present invention is not limited to this particular embodiment for water dissipation component 230 and cushioning component 240. For example, a single hybrid structure could be utilized for base portion 200 that would include the material properties to provide for both water dissipation and conforming structure.

[032] Figure 3 also illustrates an alternative embodiment for insert portion 300. Whereas the previously disclosed embodiment for insert portion 300 was discussed as a single structural member that could include a tacky surface on a top side thereof, the embodiment of Figure 3 for insert portion 300 is comprised of a plurality of layers. As can be seen, layers 301-305, comprise insert portion 300. Each of the layers may include a tacky surface on a top side thereof, as was described previously for insert portion 300. In use, a top-most layer, e.g., layer 301, may be removed from its adjacent lower layer, e.g., layer 302, and may be independently cleaned. After cleaning, the layer may be reinstalled within recess 210 on top of the exposed layer of insert portion 300. In this manner, insert portion 300 may be cleaned by removing a top-most layer, cleaning that layer, and reinstalling that layer within recess 210. Whereas each layer is described as being independently cleanable, it is not required that each individual layer be cleanable.

Each layer may be formed of materials as described previously when discussing the embodiment of Figures 1 and 2 for the insert portion.

[033] As discussed above, insert portion 300 may be comprised of a variety of materials, including materials such as tacky plastics, paper, or adhesives that can be cleanable and may or may not be erodible and reusable. If paper is utilized, the insert portion may be formed as a single structural member or as a plurality of layers, as discussed previously. Additionally, the paper may include a tacky surface on a top-side thereof. The paper may be translucent, opaque, or colored, and may include a graphic display thereon.

[034] As discussed earlier, it is desirable, but not required, that the floor mat contain a water dissipation and/or absorption capability. This capability is desired to help prevent the tacky surface of the insert portion from becoming excessively wet and, thus, slippery. Whereas it has been discussed that, in order to help prevent a user from slipping on the tacky surface of the insert portion, a water dissipation and/or absorbing capability could be included in the floor mat to reduce the degree of moisture on the tacky surface, this is not the only structure contemplated for preventing the tacky insert portion from becoming slippery. Alternatively, the tacky insert portion itself could be formed to help prevent slipping. Figures 4-6 illustrate alternative embodiments for tacky insert portion 300. Figure 5 illustrates tacky insert portion 300 as including a grid pattern 320 of channels 322 that could be comprised of a non-tacky material. The channels could be either raised from the surface of insert portion 300 or could lie co-planar with the top surface of the insert portion. By forming the channels of a non-tacky material, even if the tacky material of insert portion 300 became wet, a user would be assisted in not slipping on the slippery, wet tacky surface of the insert portion by the presence of the non-tacky surfaces which do not become slippery when wet.

[035] Figures 5 and 6 illustrate another alternative embodiment for tacky insert portion 300 which includes anti-slip particles 324, e.g., silicon or sand particles, which extend above the top surface 330 of the tacky insert portion. It is desirable that the anti-slip particles be comprised of a material that does not become slippery when wet and that they be exposed from the tacky surface, however, it is not required. Even if the anti-slip particles are embedded within the tacky surface, their extension above the top surface 330

of the tacky insert portion will provide a physical frictional restraint against slipping for the soles of a person's shoes who is standing on the floor mat.

[036] Whereas Figure 4 illustrates tacky insert portion 300 as including a grid pattern 320 of channels 322 that could be comprised of a non-tacky material and Figures 5 and 6 illustrate another alternative embodiment for tacky insert portion 300 which includes anti-slip particles 324 which extend above the top surface 330 of the tacky insert portion, it is not required that these two alternative embodiments contain features that are mutually exclusive. For example, it is contemplated that tacky insert portion 300 could include both a grid pattern of non-tacky channels and anti-slip particles, which is not illustrated specifically in the Figures but which can be easily understood.

[037] Another alternative for providing a slip-resistant tacky portion is to include a plurality of anti-slip members, or treads or nipples, that extend up through and slightly above the surface of the tacky portion. As can be seen in Figure 7, in this embodiment, tacky portion 300 is inserted within a base portion, which may be a water absorbent border 500, and includes a plurality of apertures 342 within it. Each of a plurality of treads 344, which may extend upward from a base disposed underneath tacky portion 300, extend up through one of the plurality of apertures 342. A top-most end of each tread extends above a top-most surface 340 of tacky portion 300. As a person steps onto tacky portion 300, the quantity and positioning of the treads 344 is such that the tacky portion is able to remove debris from the person's shoes and the treads 344, at least one of which is stepped upon by the person, prevents slipping of the person on the tacky portion 300 should the tacky portion 300 become slippery when wet. The treads 344 may compress when stepped upon such that the top-most end of the tread is co-planar with the top-most surface 340 of the tacky portion 300. In this manner, the tread will contact the person's shoes to prevent slipping but yet not hinder contact between the person's shoes and the tacky surface of the mat, which enhances the cleaning of the person's shoes. Therefore, there is a relationship between the distance that the tread extends above the top-most surface of the tacky portion and the compressibility of the tread; a relationship which provides the functionality discussed above.

[038] The treads may be configured in any shape and size. Additionally, the treads may be comprised of any material which is slip-resistant when wet, such as, for example,

rubber or plastics. The treads may include grooves within them to further assist in preventing a person from slipping on the tacky portion.

[039] Processes for forming an insert portion 300 comprising a plurality of separable layers as discussed earlier with reference to Fig. 3 are described in the following. A basic material for forming the layers could be a low-density polyethylene, bi-axially oriented polypropylene or polyester film manufactured and distributed in bulk quantities in units of continuous rolls. The basic material could also be provided in the form of individual sheets. Typically, film is fed from the rolls and sent through a series of mechanized and automated layering processes involving the application of adhesive to provide a tacky surface and the cutting of layers into the desired shape.

[040] For example, Fig. 8A shows an apparatus configured to form a multi-layer insert portion 300 (hereinafter, "tacky insert") using a rotary die cutter. A number (for example, 12) of individual rollers 2900 are shown for feeding layer materials to a laminator 2901 and then to a rotary die cutter 2903. The layers are fed in a continuous form known as a "web." A laminator is a known machine which is configurable to apply a pre-determined amount of pressure and tension via rollers to a plurality of webs so as to join webs to each other with a desired bonding strength. For example, the laminator would apply sufficient pressure such that, once finished, a tacky insert would not easily separate into its constituent layers upon casual handling, but not so much pressure that layers would effectively fuse together and be difficult to separate by deliberate manipulation and application of force for that purpose.

[041] After the layers are joined by the laminator to form a 12-layer web 2902, they are processed by the rotary die cutter 2903. The rotary die cutter 2903 cuts a 12-layer tacky insert 300 of a desired shape from the web 2902.

[042] A more detailed example of a rotary die cutter is shown in Fig. 9. A rotary die cutter typically comprises at least two substantially cylindrical drums 3000 juxtaposed and rotating in opposite directions to each other. The drums rotate on shafts 3002 driven by gears 3003. Outer surfaces of the drums include engraved knives 3001 outlining a desired shape to be cut out of a web 3004. A shape on one of the drum surfaces is the mirror image of the shape on the opposing drum surface. The drums are aligned and their speed of rotation is set so that corresponding knives on the respective drums come into

contact during rotation, cutting the desired shape out of the web material. Alternatively, the engraved knives could be on only one drum, while the opposing drum had a smooth surface. Typically, a stripping device (not shown) is used to separate the cut-out web material from the drums.

[043] Fig. 8B shows an alternative configuration utilizing a rotary die cutter. In Fig. 8B, the tacky insert shapes (hereinafter, "sheets") are first cut out of the basic materials for the respective layers, then joined by a laminator to produce the tacky insert. Top layer material is fed to a top layer rotary die cutter, rotary die cutter #1, which is used to cut out an insert sheet for the top layer. Intermediate layer material is fed to a second, single layer rotary die cutter, rotary die cutter #2, which is used to cut out insert sheets for the intermediate layers. In the present example, 10 intermediate layer insert sheets are successively cut out by rotary die cutter #2 and stacked in an intermediate stacker (not shown) prior to being laminated together with top and base layer insert sheets. Base layer material is fed to a base layer rotary die cutter, rotary die cutter #3, which is used to cut out an insert sheet for the base layer. Then the top layer, standard layers and base layer insert sheets are laminated together by laminator 2901 to produce a tacky insert 300.

[044] Fig. 8C illustrates a configuration wherein the insert sheets are cut out of their respective materials before being laminated together, but wherein each layer of the tacky insert is cut to shape by an individual rotary die cutter.

[045] Figs. 10A- 10D show plan views of additional embodiments of a tacky insert 3106 such as could be formed by the above-described process. Figs. 10A-10D show a different kind of aperture in the tacky insert for receiving anti-slip components of the base portion. Whereas, in the embodiments of earlier-discussed figures, the apertures are relatively elongated in order to receive elongated, "rib-like" anti-slip components, in Figs. 10A-10D, apertures 3107 have a substantially circular form, for receiving nodular, "bump-like" anti-slip components. The apertures 3107 could have various arbitrary distributions, as shown in the figures. Also, the aperture shapes are not limited to circular shapes but could have arbitrary shapes, such as oval, square, rectangular or triangular shapes.

[046] As shown in Figs. 10A-10D, a remove tab 3100 may be provided on an edge of the tacky insert. The remove tabs 3100 could be formed of the same material as the

tacky insert during a die-cutting process as discussed above, but without any adhesive, to enable easy handling. The remove tab could alternatively be formed from a different material and fastened to the tacky insert. The remove tab location is arbitrary.

[047] According to embodiments, the tacky insert 300 may be provided with a non-smooth texture on a top surface thereof. This may be done because if the tacky insert has a substantially smooth top surface, an undesirable glare or shine may be created by light reflected from the surface, since a smooth surface tends to reflect light in a given predominant direction. The glare or shine may reduce the cosmetic appeal of a floor mat including the tacky insert.

[048] "Non-smooth texture" means that at least a portion or substantially all of a surface of the tacky insert material includes areas of differentiated height, i.e., areas that are either raised or recessed in comparison to adjacent areas. Thus, visually and in terms of feel, the surface could be characterized, among other ways, as "irregular," "bumpy," "rough" or "grainy." A resulting effect may be that light that is incident on the surface is broken-up and scattered by the irregularities in the surface. Therefore, instead of being reflected predominantly in one direction to create shine or glare, the light is diffused, reducing glare or shine and giving the surface a more aesthetically pleasing appearance.

[049] As shown in Fig, 11, in embodiments, a non-smooth texture could be formed in an untextured or substantially smooth insert material 4000 by causing the untextured material to pass between textured rollers 4001 while applying pressure from the textured rollers to the material. "Textured" rollers means rollers having protrusions on their outer surfaces, so that when pressure from the rollers is applied to the material, the protrusions on the rollers are impressed into the material, deforming part or all of the originally smooth material. The shape of the protrusions is arbitrary. Although the textured rollers could be applied to the material while the material was at about room temperature, the rollers could be applied as the material was fed from the output of an extrusion die. Thus, the material could still be warm and somewhat pliable, and therefore more easily shaped. After being passed through the textured rollers 4001, the (now-textured) insert material could spooled to form a roll of textured insert material 4002.

[050] As shown in Fig. 12, in alternative embodiments, the textured rollers 4001 could be heated, and untextured material 4000 could be fed to the rollers 4001 from a roll

of untextured material 5000 at about room temperature. In an operation using heated textured rollers, the temperature of the rollers could be at or near the glass transition temperature (Tg) of the insert material. Depending on the feed rate of the material to the rollers, the amount of pressure that can be reasonably applied to the material, and thermal losses, it may be advantageous to heat the rollers to a temperature above the Tg of the material. While a process using heated textured rollers could be done with nearly any thermoplastic material, the process is typically easier with lower Tg materials such as polyethylene or polypropylene. However, any suitable material is within the scope of the present invention, and the present invention is not limited to the use of polyethylene or polypropylene.

[051] After being passed through textured rollers, heated or unheated, the resulting textured insert material could be spooled onto a roll for subsequent processing. The subsequent processing could include application of adhesive, lamination and die-cutting into individual sheets or stacks of sheets as described above.

[052] Fig. 13 shows an example of a tacky sheet, for example layer 301 as shown in Fig. 3, comprising a non-smooth texture 6000 formed, for example, by application of heated or non-heated textured rollers. Further illustrated in Fig. 13 are apertures 3107 and a remove tab 3100. Figs. 14A-D are cross-sectional views showing examples of possible non-smooth textures 6000, but the possible non-smooth textures are not limited to those shown in Figs. 14A-14D. As shown in Figs. 14A-C, the non-smooth texture could include raised areas or bumps 6001 as shown in Fig. 14A, indented areas or indentations 6002 as shown in Fig. 14B, or combinations of both as shown in Fig. 14C. As can be seen in these figures, the non-smooth texture may be described as areas of differentiated height with respect to adjacent areas. For example, a bump 6001 is higher than an adjacent undeformed area 301.1 of the tacky sheet 301 in Figs. 14A and 14C. An indentation 6002 is lower than an adjacent undeformed area 301.1 of the tacky sheet 301 as shown in Figs. 14B and 14C. On the other hand, substantially all of the surface of a tacky sheet could be deformed, as shown in Fig. 14D. While Figs. 14A-D show a substantially regular pattern or distribution of raised areas and/or indentations, the raised areas and/or indentations could be randomly distributed.

[053] According to further embodiments, a non-smooth texture could be given to a surface of the insert material by processes for abrasion of the surface, such as sand-blasting, acid-etching, plasma treatment, corona treatment or any other suitable method for roughening a smooth texture of an insert material. The abrasion may create areas of differentiated height in the surface, in particular by forming a distribution of small indentations or recesses in the material, which may act to diffuse incident light as described above. After being treated with an abrasion process, the resulting textured insert material could be spooled onto a roll for subsequent processing. The subsequent processing could include application of adhesive, lamination and die-cutting into individual sheets or stacks of sheets as described above.

[054] In still other embodiments, a non-smooth texture could be created by treating the adhesive applied to the insert material in some way. For example, a texturing substance could be added to the adhesive before it was applied to the insert material. The texturing substances could include, for example, silica, chopped fiber, talc, or ground plastic. The texturing substance in the adhesive, when applied to the insert material, may create a rough, grainy or irregular surface on the material; i.e., areas of differentiated height formed, in particular, by a distribution of small particles that form bumps or raised areas, thus diffusing incident light. The adhesive containing the texturing substance could be applied to a roll of smooth insert material (i.e., a roll previously untreated for texturing), or to a roll already treated for texturing by textured rollers as described earlier. The texturing substance could also be applied at substantially the same time as the adhesive is applied, e.g., added to the adhesive as the adhesive is applied, or after the adhesive is applied.

[055] All of the disclosed embodiments are illustrative of the various ways in which the present invention may be practiced. Additionally, any of the disclosed embodiments may be combined in any embodiment of the present invention and the present invention is not limited to only the particular combined embodiments disclosed. Other embodiments can be implemented by those skilled in the art without departing from the spirit and scope of the present invention.